

SUSTAINABLE PRODUCT DEVELOPMENT THROUGH CREATIVE UP-CYCLING OF FABRIC WASTE

AKRITI SHAKYA^{*1}, CHARU SWAMI² & PRAVEEN VERMA³

¹Research Scholar, Department of Home Science, Dayalbagh Educational Institute, (Deemed University), Dayalbagh,
Agra, India

²Assistant Professor, Department of Home Science, Dayalbagh Educational Institute, (Deemed University), Dayalbagh,
Agra, India

³Department of Home Science, Dayalbagh Educational Institute, (Deemed University), Dayalbagh, Agra, India

ABSTRACT

In this era of technological advancement, the sustainability of products has become a major concern for society. As a result of its environmental and social impacts, the textile and apparel sector is a focus of the sustainability movement. The textile sector is one of the most environmentally destructive industries in the world. Production is not the only source of producing waste, but consumption is also a source of it.

Sustainable development emphasizes the production of indigenous textiles, since it provides employment opportunities, especially for rural communities, and contributes to economic growth and environmental protection. Indian textiles and handicrafts are world-renowned. So, this research investigates the feasibility of sustainable development in fashion by developing up cycled and handmade creative products that combine technology upgrades and traditional styles in a fusion to increase consumption with sustainable development.

In this study, up-cycling techniques were explored and adopted to create a range of accessories for women from fabric waste. The later section of the paper presents key findings related to the evaluation and acceptability of sustainable products developed from waste fabric through craft-design up-cycling approaches that are congruent with the principles of sustainability.

KEYWORDS: Sustainability, Fabric Waste, Up-Cycling & Craft - Design

Received: Jun 26, 2021; **Accepted:** Jul 16, 2021; **Published:** Sep 20, 2021; **Paper Id:** IJTFTDEC20215

1. INTRODUCTION

Sustainable fashion involves creating and producing products with a minimum impact on the environment and society throughout their production and consumption lives, which includes their "carbon footprint.". To maintain a good and healthy environment in the twenty-first century, citizens should think green and keep green. Reuse, recycle and reintroduce fabrics and materials are other ways to sustain the environment.

Manufacturers and consumers are increasingly inclined to design, manufacture, and purchase green fashion. Several designers have been incorporating the concept of green into their fashion collections, right from the fabric they use to the processes used to create the clothes. The fashion industry appears to be as enthusiastic as all others when it comes to healing the planet.

Fashion accessories, on the other hand, are becoming increasingly popular in the fashion world, and sometimes, they even outweigh fashion. Investors are willing to invest more in accessories than in apparel because

fashion accessories have become a major revenue source for companies. Further, fashion accessories are complementary to an individual's appearance and can change it completely. Leung Yee Man stated in his study that it can also be found in a variety of sizes, shapes, colors, and materials that change depending on time, culture, and individual. Handmade unique accessories are a hot trend in high demand. Now, there are many designers, designing sustainable fashion accessories that potentially support the environment.

In waste management, the three R's stand for "reduce, reuse, and recycle". As the rate of waste generation, processing costs, and available landfill space have all increased, the three R's have emerged as a key element in sustainable waste management. According to researchers working in the field of waste management, there is a hierarchy of approaches that can be adopted for the management of waste in the fashion industry (El-Haggar et al., 2007). To manage textile waste properly, textile waste recycling, reclamation, and reuse have become essential. In addition to being green, these technologies reduce raw material costs and provide substantial profitability.

The recycling industry has grown rapidly over the last few years as part of the environment. It has always fascinated the consumers to think about recycling and reusing textile waste, both pre-and post-consumer. Many factors contribute to the rise of recycling interest, including green consumerism, rising waste disposal problems and raw material costs, legislative mandates, and the evolution of waste into a marketable commodity. The possibilities for reuse and up-cycling clothing fabrics are endless, as fabrics are a fantastic resource. The innovative use of pre-consumer and post-consumer fabric waste in the creation of eco-fashion can be seen in the repurposing of hairbands, bracelets, necklaces, belts, hats, scarves, and gloves.

Despite its energy-saving properties, handicraft production is not an essential part of contemporary mass-market manufacturing. However, symbolically, it can strengthen attachments and appreciation for a product. Handcrafting is a product/article that can enhance its individuality by adding unique details. Many utility articles can be made using appliqué work and patchwork by using printed fabrics, denim, and brocade designs, etc.

1.2 Sustainability

In recent years, the concept of "Sustainability" has been emphasized as up-cycling, recycling, reconstruction, and waste-minimization design strategies, and it has become a hot and continuous fashion trend everywhere. Some well-known businesses, such as H&M and Levi's, and designers have gone forward to reproduce eco-friendly designs for their new season collection using recycled materials. Furthermore, there are a variety of tactics that can be used to support the environmental consequences of the fashion industry's design and production processes.

With each passing year, the trend toward developing, making, and purchasing green apparel grows. Natural apparel and accessories are becoming more widely available in major department stores around the world, according to news sources from around the world. Designers are moving toward green in their fashion lines now more than ever before, from the fabrics used to the manufacturing method. According to all accounts, the fashion industry is just as committed to environmental healing as the rest of us (Holgar 2009).

A considerable amount of waste is disposed of in landfills each year in today's world of sophisticated technologies, high demands, and consumption. This has economic and environmental consequences for society, as well as significant resource depletion and waste. Although public awareness of environmental issues has risen dramatically in recent years, there is still a need to investigate some creative sources that are more sustainable and environmentally

friendly to meet the essential needs. Utilization of trash generated during manufacture and consumption of items looks to be the developing option in this circumstance. (Moon, 2013).

Gay (2011), argued in his study that if the waste is being prevented from being generated in the first place it would contribute to the principle of economy in design, fabric and execution. With each passing year, the trend toward developing, making, and purchasing green apparel grows. According to news sources from throughout the world, an increasing number of big department stores are stocking natural apparel and accessories. Designers are moving toward green in their fashion lines now more than ever before, from the fabrics used to the manufacturing method. According to all accounts, the fashion industry is just as committed to environmental healing as the rest of us. (Holgar 2009).

Handcrafting can also be a component of a sustainable fashion strategy. Despite the fact that handmade production saves energy, it cannot be a requirement for sustainable production in today's mass-market manufacturing. On a symbolic level, though, it can increase appreciation and devotion to a garment. Handcrafting is a valuable technique to add distinctive touches to a garment and emphasize its uniqueness. Hand-made clothing, like haute couture, can provide something unique, and this might be one approach to improve a product's sensory qualities. (Claudio 2008).

Therefore, keeping in mind the above facts, this study was planned to design and create eco-fashion accessories with waste fabric scraps to sustain the environment.

1.3 Objectives of the Study

- To study design and colour preferences for the development of eco-fashion accessories.
- To develop suitable eco-fashion accessories from waste/leftover material of zari /brocade and Denim.
- To assess the consumer acceptance of the developed eco-fashion accessories

2. RESEARCH DESIGN

This experimental study was conducted to develop up-cycled fashion accessories using waste, discarded or used fabric waste based on consumer preferences for designs, texture, and embellishment. The methodology employed in the investigation is as follows-

2.1 Collection of Waste Fabric

The researcher collected Brocade/Zari and Denim waste from boutiques, tailors, friends, shops, and relatives as follows:

2.2 Selection of Fashion Accessories

Based on information collected from the respondents regarding the development of various accessories, designs feature for the accessories, and embellishments, the researcher selected two types of accessories to be designed and created.

- Jewelry
- Bags
- Collars/ Stoles

2.3 Creating Fashion Accessories

The researcher used the collected waste fabric scraps to create various new value-added fashion accessories.

The creation of these fashion accessories was done in the following stages:

Stage I –Cutting

The created patterns were placed on these fabric scraps for cutting. While cutting the fabric the researcher kept in mind the concept of sustainability of the environment.

Stage II- Stitching and Tucking

After cutting the fabric, the researcher constructed and created these accessories. The accessories were stitched or tucked using appropriate seams, finishes and fasteners.

Stage III- Adornment

After creating the accessories, the researcher used different types of Buttons, Buckle, Embroidery, Frills, and Lacing, etc. for making these accessories attractive and elegant.

2.4 Locale of the Study

To carry out the present study, Dayalbagh Educational Institute, Agra, was conveniently selected.

2.5 Sample Selection

Sample selection was done based on convenient access to the investigator from the area of study i.e., Dayalbagh Educational Institute. 50 undergraduate and post-graduate students' female respondents were selected who are having a background in clothing and textiles.

2.6 Evaluation of the Created Accessories

The created fashion accessories were analyzed by 50 respondents who are aware of the latest fashion trends. The accessories were displayed, and respondents were asked to evaluate each design based on their design, attractiveness, elegance, and appearance.

For this, an interview schedule was constructed to study the response of respondents regarding the fashion accessories based on suitability of design, embellishments, and overall impact.

2.7 Statistical Analysis

The ranking method was used by the researcher as a tool for visual analysis of designs of the created accessories. Percentage and averages were used to analyze the results. The results of the study were as follows-

- In the present study, 10Jewelry (Necklaces), 10 Bags and 10 different Collars and stoles were created. In total 30 different accessories were designed and created. These designs and patterns were created using cutting, stitching, adornment by using collected fabric waste.

2.7.1 Brocade Fabric Waste Jewellery

Table 2.1: Showing the Jewelry of Brocade Waste

 <p>BJ1</p>	 <p>BJ2</p>	 <p>BJ3</p>	
 <p>BJ4</p>	<p>Brocade fabric waste Necklaces</p>		 <p>BJ5</p>

2.7.2 Brocade Fabric Waste Bags

Table 2.2: Showing Handbags Created with Brocade Waste

 <p>BB1</p>	 <p>BB2</p>	 <p>BB3</p>	
 <p>BB4</p>	<p>Brocade fabric waste Bags</p>		 <p>BB5</p>

2.7.3 Brocade Fabric Waste Collars/Stoles



2.7.4 Denim Bags



2.7.5 Denim Waste Necklaces



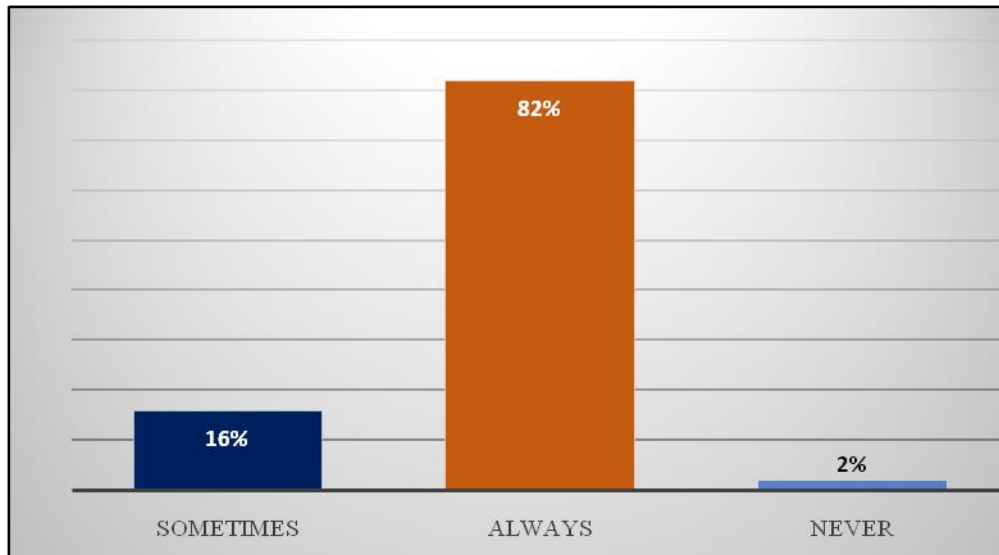
2.7.6 Denim Waste Collars/Stoles



- In the present study, a self-made questionnaire was prepared for 50 respondents students, to evaluate the acceptability of the created fashion accessories designed by the researcher. The questions included were related to assessing the awareness of respondents regarding up-cycling, the acceptance of these accessories.

Table 2.3: Showing Willingness to Buy Creative up-Cycled Fashion Accessories

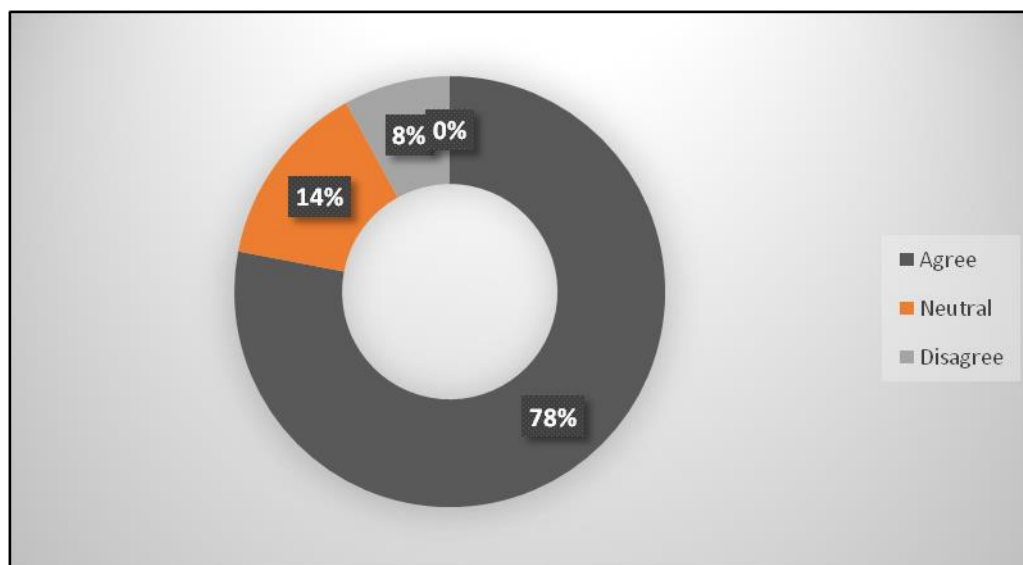
Item	N=50		
	Always	Sometimes	Never
Willingness to buy creative up-cycled fashion accessories	8(16%)	41(82%)	1(2%)

**Figure 1**

Around most of the respondents, 82% were sometimes willing to buy creative up-cycled fashion accessories, 16% respondents were always willing to buy whereas 2% respondents were never willing to buy creative up-cycled fashion accessories.

Table 2.4: Showing Up-Cycling Help to Reduce Waste and Save Our Environment

Item	N=50		
	Agree	Neutral	Disagree
Upcycling helps to reduce waste and save our environment	39(78)	7(14)	4(8)

**Figure 2**

- About 78% of respondents agreed that the concept of up-cycling if introduced effectively, would help to reduce waste and save our environment whereas 8% of respondents did not agree that up-cycling would help to reduce the waste generated at the industrial level and at the domestic level to save our environment from pollution, soil irrigation and disposable of waste into water bodies.

2.8 Ranking for the most Preferable Design of Handbags

These all up-cycled products were demonstrated and ranked by respondents and the results were as follows. For brocade accessories, bag design BB4, neckpiece design BJ1, collar design BC4 and for Denim accessories, bag design DB4, neckpiece design DS1, and collar design DS4 got 1st rank by respondents.

3. CONCLUSIONS

Up-cycling of fabric waste is a better option compared to recycling garment waste. Though Up-cycling products are sold in the local lower end of the market as the quality and finishing of the products is low and does not match the requirements of the current trend and market because this sustainable practice is not in high demand due to fast fashion. Therefore, there is an urgent need to create upcycled products on a large level with higher quality, uniqueness and finishing. Upcycling could help retailers to reuse waste materials for their products instead of having new materials so, this could reduce the amount spent on production that is being used for materials and labor.

The use of fabric waste has attracted great interest to private entrepreneurs, artists, designers, hand makers. Nowadays consumers are showing willingness and interest to buy creative upcycled fashion accessories on a little higher price too because the upcycled products are unique, stylish and could be a part to sustain the environment. One of the best benefits of upcycling is, that it supports local industries and businesses. In the past years, the market of handmade products made out of fabric waste has increased and it is proved helpful to hundreds of artisans who are totally dependent on this local business. From manufacturers to providers of sustainable waste management to local retailers, upcycling helps to boost the economy for communities with the awareness of a sustainable environment.

Therefore, there is an urgent demand to boost this practice for not only accessories but also for apparel, home products etc. As this practice is handcrafted so it could also be helpful for rural artisans to make their livelihood without making any harm to the environment.

REFERENCES

1. Claudio, L 2007, „Waste couture: environmental impact of the clothing industry”, *Environmental Health Perspectives*, vol. 115, no. 9, pp. A448 - A454, (JSTOR database).
2. El-Haggag, S. M. (2007). *Sustainable industrial design and waste management: Cradle-to-cradle for sustainable development* (p. 424). Oxford: Elsevier/Academic Press
3. Moon, K. K. L., Youn, C., Chang, J. M., and Yeung, A. W. H. 2013. “Product design scenarios for energy saving: A case study of fashion apparel”. *International Journal of Production Economics*, 146(2):392-401.
4. Monika Holgar, M. F.-R. (2009). *Fashion as a Communication Medium to Raise Environmental Awareness and Sustainable Practice*. Australian and New Zealand Communication Association Conference. Brisbane, Queensland: Queensland University of Technology.
5. Leung Yee Man (2011) *Creation of sustainability in fashion accessories*. <http://www.itc.polyu.edu>.

6. Sandin, G., & Peters, G. M. (2018). *Environmental impact of textile reuse and recycling: A review. Journal of Cleaner Production*, 1, 1-24
7. Wallander, M, 2012. *T-shirt blues: The environmental impact of a t-shirt*. http://www.huffingtonpost.com/mattias-wallander/t-shirt-environment_b_1643892.html Accessed on 2 June 2021.
8. Kavitha, S., and G. Manimekalai. "A study on waste disposal management in garment industry." *International Journal of Textile and Fashion Technology (IJTFT)* 4.5 (2014): 37-42.
9. Jain, P. R. E. R. N. A., and C. H. A. R. U. Gupta. "Textile recycling practices in India: a review." *International Journal of Textile and Fashion Technology* 6.6 (2016): 21-36.
10. Bori, Geetashree, and M. NeogRupjyoti. "Emerging Trends in Woven Textile Fabrics Designs of Tribal Mising Community in Assam." *International Journal of Applied and Natural Sciences (IJANS)* 6.5 (2017): 7-14.
11. Karunaratne, P. V. M. "Unstructured Clothes-No Cut, No Sew: Sustainable Dress Practices of Sri Lanka." *International Journal of Humanities and Social Sciences (IJHSS) ISSN (P)* (2018).